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BENEFITI PROGRAMA OBUKE O ZNANJU, ODNOSU I PONAŠANJU RADNIKA PREMA BEZBEDNOST I ZDRAVLJU NA RADU - STUDIJA SLUČAJA U NAFTNOJ I GASNOJ INDUSTRIJI GANE

BENEFIT OF OHS TRAINING PROGRAMS ON WORKERS KNOWLEDGE, ATTITUDE AND BEHAVIOUR TOWARDS HEALTH AND SAFETY. A CASE STUDY INTO THE GHANA OIL AND GAS INDUSTRY

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Oblast: INŽENJERSTVO ZAŠTITE NA RADU

Kratak sadržaj - *U okviru istraživanja analizirane su prednosti programa obuke za bezbednost i zdravlje na radu u kontekstu o stečenog znanja, odnosu i ponašanju prema bezbednosti i zdravlju na radu u i ndustriji nafte i gasa Gane Za potrebe istraživanja sprovedena je anketa radnika tri velike naftne i gasne kompanije, koje posluju na teritoriji Gane. Specifični ciljevi istraživanja obuhvatili su ispitivanje uticaja nivoa znanja, odnosa i ponašanje radnika prema BZNR u njihovom radnom okruženju, kao i ispitinjanje uticaja obuke na idenitikaciju i prevenciju opasnosti na radnom mestu, povrede i prevenciju bolesti. Rezultati istraživanja ukazali su na značajan nivo znanja i pozitivan stav radnika prema BZNR i homogeno ceni njihovu situaciju u pogledu bezbednosti na radu. Takođe je ukazano da korelaciju BZNR obuke i sposobnosti za se preventivno deloje na pojavu opasnosti i povreda na radnom mestu.*

Ključne reči: *Bezbednosti i zdravlje na radu, Nafta i gasm, Akcidenti, Prevencija opasnosti i bolesti.*

Abstract - *This study explored the benefit of Occupational Health and Safety (OHS) training programs on workers knowledge, attitude and behaviour towards health and safety, in the Ghanaian oil and gas workspace. Through a convenience sampling techniques, three major oil and gas companies, which operate in the entire length of the petroleum sector, upstream, mid-stream and downstream, were selected for the study. The specific objectives, which guided the study, were to examine the knowledge level, attitude and behaviour of workers towards health and safety at their working environment and ascertain the impact of occupational health and safety training to incidence prevention and impact on injuries and disease prevention. A descriptive analysis was used to measure the central tendency, dispersion and variability of responses or data collected. The study established a significant knowledge and positive attitude of workers towards OHS and have a homogeneous appreciation of their workplace safety situation. A regression analysis also indicated a positive significant relationship between OHS training and the two-dependant variables (incidents prevention and injuries & disease prevention). In that, Occupational Health and Safety Training (OHST) accounts for 54.3% of the variation in incidences prevention and 42.1% of the variation in injuries and diseases.*

Keywords: *Occupational Health and Safety, oil and gas, Incidence, Injuries and Disease prevention.*

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1. INTRODUCTION

A rise in global population and advances in technology has sparked industrialization and business of all kinds, which brought with it immense upheavals in economies and in the organization of the societies. This industrialization brings many economic and other benefits, as well as a wide range of workplace hazards and unsafe working conditions, which pose risks to the health and safety of people at work and the energy industry is no exception. Ghana, as a developing nation, has a high estimated accident rate of 15,702 per 100,000 workers and a fatal accident rate of 1852, with 20.6 fatalities per 100,000 workers across all industries, [8]. According to [7], there are indeed unique safety hazards inherent in the operations of the oil, gas, and related energy industries that have the potential to endanger life, property and the environment if not controlled or managed properly.

With Ghana serving as an example of the many developing countries in the globe with above-average rates of subpar occupational health and safety (OHS) results, this study seek to explore how occupational health and safety training programs influences workers attitude and behaviour towards health and safety in the oil and gas industry. It examines how safety-training programs affect the knowledge level, attitude and behaviour towards working safe in their various working environment, and its impact on the prevention of incidence, injuries and diseases at the workplace. The associated objective seek to investigate the extent to which these training programs influences and guarantee a safe working environment.

2. MATERIAL AND METHOD

2.1. Procedure and participants

Through a convenience sampling techniques, three major oil and gas companies were selected, Ghana National

Petroleum Company (GNPC), Ghana National Gas Company (GNGC), and ENI Ghana, which operate in the entire length of the petroleum sector, upstream to downstream, for the study.

A set of self-report questionnaires were completed by participants, which consisted of workers who are directly involved in critical safety task and considered to be highly exposed to hazards in their work environment. Consisting of engineers, crane operators, maintenance personnel, machine operators, laborers and safety instructors

To ensure survey validity and reliability, a pilot test was conducted among 21 supervisors and health and safety officers in the selected companies and the feedback incorporated into the final survey. As extant literature suggests, a pilot test sample should be 10%–20% of the sample projected for the parent study [1].

Survey reliability was determined using Cronbach's (α) with a coefficient 0.817 to check the internal consistency of the survey items. Which is greater than the required threshold of 0.70. As a range from 0.7 to 1.0 denotes consistency of the survey [3].

2.2. Measurements

Descriptive survey design paradigm [2]. which had four sections (A–D), with responses of workers measured on a five-point Likert scale, ranging from 1 = Strongly Disagree (SD) to 5 =Strongly Agree (SA). Section A of the questionnaires collected demographic data including gender, age, and level of education and years of working experience in the various firms. Section B assessed knowledge, attitude and behavior of workers towards OHS, whereas Section C assessed impact of OHS training program on incidents prevention and Section D assessed impact on injuries and diseases prevention.

3. Data Analysis

Descriptive analysis such as mean score was used to measure the central tendency of the variables. Standard deviation was used to measure dispersion and variability of responses from the targeted population. The analysis of mean provides the average response regarding employees' knowledge level and attitude toward OHS. Inferential analysis gives an in-depth explanation of the findings. Multiple linear regression was used to investigate the influence of employees'OHS training on incidence and impact on injury and disease prevention.

4.0. Analysis and Discussion of Results.

With 376 estimated workers, 149 completed responses were received, However, the analysis were based on the responses of 127 respondents and 22 were rejected based on the respondents not being actively involved in the oil and gas or any of the selected companies. As suggested in [4], a minimum sample of 100 individual is satisfactory for descriptive studies, whereas sampling between 10 and 20% of the population is recommend in [6]. Thus, out of 127 respondents, figure 1 below, shows the organizational respondent distribution.

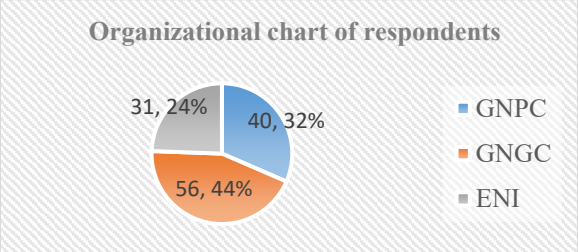

Figure.1. Organizational chart of respondents.

4.1. Analysis Respondents' Demographic Data

From the demographic data shown in table 1, it is evident that, majority of the employees are matured and have extensive experience, which could potentially foster positive attitudes and behavior toward occupational health and safety within their organizations. Again, a majority at 92.9% (f= 118) having tertiary-level education could resonate a high knowledge level and understanding of OHS principles.as stipulated by some researchers, the level of education of workers influences their knowledge level, attitude and behavior towards OHS [5]. Moreover, experience has been identified as influencing the quality of task performance and safety consciousness.

Table 1. *Demographic data of respondents*

Gender	Frequency	Percentage %
Male	104	82
Female	23	18
Age distribution		
18 - 30	21	16.5 %
31 - 40	76	59.8 %
41 - 50	18	14.2 %
50 – 60	12	9.4 %
Literacy level	118	
Tertiary education	118	92.9%
Secondary/ technical Education	9	7.1%
Work experience (year range)		
< 5	21	16.5%
5 – 10	84	66.1%
11 and Above	22	17.3%

4.2. Employees Knowledge Level, Attitude and behaviours towards OHS

From Table 2, it is revealed that OHS training programs has a positive influence of workers knowledge and behavior at their work environment. These findings reveal that, on average, most employees have relatively high knowledge and positive attitude towards OHS with an overall mean score of 4.194 and a standard deviation of 0.5485. The SD score of 0.5485 confirms that the employees response concerning their knowledge and attitude towards OHS were clustered close to the mean score, further indicating that they have a homogeneous appreciation of their workplace safety situation.

Table.2. *OHS training programs employees 'knowledge of occupational hazards using mean scores and standard deviation.*

STATEMENTS		MEAN	SD	RK
1	I have the necessary knowledge of health and safety about various working environment in the firm.	3.022	0.4615	7th
2	I know how to reduce the risk of accidents and incidents in the workplace	4.409	0.5607	2nd
3	I am aware of the require PPEs in the company and use them for my protection	4.433	0.5596	1st
4	I know what are the hazards associated with my jobs and the necessary precautions to be taken while doing my job.	4.341	0.5153	6th
5	I have knowledge about the various hazards I faced within my work environment and report exposures to an occupational hazard be documented by appropriate authorities.	4.397	0.5586	4th
6	I have knowledge on how to maintain or improve workplace health and safety	4.357	0.5276	5th
7	I know how to use safety equipment and standard work procedures to perform my job in a safe manner	4.398	0.5586	3rd
Average mean/SD		4.194	0.5485	

For example, majority of employees indicated that they were aware of the required personal protective equipments in their companies and use them for their protection with a mean of 4.433 and a standard deviation of 0.5596, and first in the rankings as shown in table 2.

They exhibited extensive knowledge on OHS and a positive attitude of injuries, disease and incident prevention, as they indicated that they know how to use safety equipment and standard work procedures to perform jobs in a safe manner and also have knowledge of how to maintain or improve workplace health and safety with relatively high mean values. Which is resonates with the findings of Wahab et al. (2014) who found that training workers on performance management of OHS is important across companies and industries.

4.3. Impact of Occupational Health and Safety Training on Incidence Prevention, Injuries and Disease Prevention.

Assessing the impact of OHS training programs on incidents, injuries & disease prevention, a break down of the regressions analysis clearly indicated a positive significant relationship between OHS training and the two-dependant variables with positive regression coefficient (R) of 0.737 and 0.649 for incidents and injuries & disease prevention respectively. That is OHS training considerably influences both incidents as well as injuries and diseases prevention for all selected companies in Ghana's oil and gas industry. From the tables of result, it has showed that FIP = 64.854 and FIDP=55.847 ($p < 0{:}01$) were recorded for the combined three companies selected for this project. Moreover, as indicated by R^2 (coefficient of determination), it can be interpreted that, OHS Training determines 54.3% (R^2 = 0.543) of the variation and 42.1% (R^2 = 0.*421*) of the variation in incidence and injuries & diseases prevention in the selected companies. As explained by Jambwa and Chitongo (2013), OHS training is a key to injury prevention, and that companies perform poorly at protecting their workers from accidents and diseases, by failing to provide them with the requisite OHS training.

Table 3. Regression analysis of OHS Training programs on incident and Injuries & Disease prevention results.

	β	R	R^2	F	t
OHST & IP	-0. 642	0.737	0.543	64.854	-7.582
OHST & IDP	-0.513	0.649	0.421	55.847	-5.721
Dependent variable: independent variable : OHST Incidents prevention (*IP) ($p < 0{:}01$) Injuries and diseases prevention (*IDP)					

5. CONCLUSION

This study assessed the benefit of OHS training programs on the knowledge, attitude and behaviour of employees in the Ghanaian oil and gas industry and how it impact incidents, injures & diseases prevention at the workplace. Importantly, it revealed that employees do hold significant knowledge and a positive and optimistic behaviour regarding OHS and respective mitigating safety measures necessary to reducing incidents and injuries at work.

In addition, the study confirmed that employees do comply with occupational health safety practices, such as wearing required PPE as a last line of protection. However, the study also found that, OHS training on employees' knowledge, attitude and behaviours towards OHS, and its impact on incidents and injuries &diseases prevention were significant but not adequate for complete elimination. And that 45.7 % of the variance in incidents prevention and 57.9 % of injuries & diseases could attributed to other factors not considered in this study such as leadership attitudes, general personal behaviours governing safety standards and policies, safety culture etc.

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Short biography:

Amonoo Stephen Christ is an international student from Ghanaian under the program 'World in Serbia' 2021 to pursue a master's program in occupational health and safety engineering.
He was born in Kengen, a city in the western part of Ghana and holds a Bachelor's degree in Chemical engineering from the Kwame Nkrumah University of Science and Technology, Ghana.